

Automatic crater recognition on digital terrain model

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This study is a topic of automatic detection of craters on DTM (Digital Terrain Model) of SELENE/LISM(TC). Automatic crater recognition has been studied as a kind of pattern-matching, which includes template matching, hereditary algorithm for making templates automatically, and application of general Hough transformation. Because general Hough transformation is able to detect ellipsoids as craters with lack of edge lines of (crater rim), we adopt this. First step is extracting edges from DTM, second is extracting candidates of craters as ellipsoids, and third is removal of miss-selecting through overlapped craters. In case of plural ellipsoids (overlapped ones, and concentric ones) verifications with ideal ellipsoids are succeeded. Order of emplacement was also confirmed. In case of verification with real data, the following types were succeeded; ellipsoids with lack of edge lines, ellipsoids with rough edge lines, and ellipsoids that departed from ellipsoid shapes. Each crater requires a set of parameters in the general Hough transformation; distance, cut-off, resolution, and threshold. In this study the set of parameters are swept for finding a crater. Smaller craters are detected, and each outline of the detected crater is deleted in order. Additional function is to record following parameters for crater statistics; diameter, coordinates, depth, and direction of incidence. We introduce preliminary results and verification of this tool in poster session.